The laws of global warming

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Law professor research looks at regulating efforts to fight climate change

With policymakers and political leaders increasingly unable to combat global climate change, more scientists are considering the use of manual manipulation of the environment to slow warming's damage to the planet.

But a University of Iowa law professor believes the legal ramifications of this kind of geo-engineering need to be thought through in advance and a global governance structure put in place soon to oversee these efforts.

"Geo-engineering is a global concern that will have climate and weather impacts in all countries, and it is virtually inevitable that some group of people will be harmed in the process," says Jon Carlson, professor of law at the UI College of Law. "The international community must act now to take charge of this activity to ensure that it is studied and deployed with full attention to the rights and interests of everyone on the planet."

Carlson is an expert in environmental law and international law who believes geo-engineering is inevitable and will likely happen sooner than later. He considers the issue in a new paper, "Reining in Phaethon's Chariot: Principles for the Governance of Geoengineering," published in the current issue of the journal *Transnational Law and Contemporary Problems*. His co-author, Adam D.K. Abelkop, is a UI law graduate now in the doctoral program at the Indiana University School of Public Health and Environmental Affairs.

Carlson says the concept of geo-engineering goes back to at least the 19th century, when scientists proposed seeding clouds to increase rainfall. Today, scientists have a long list of geo-engineering ideas that could be used to slow the impact of global warming while other methods are developed to actually mitigate the damage. Some ideas are simple and locally focused, such as planting new forests to absorb carbon dioxide, or painting roofs and paved areas white to reduce solar heat absorption.

Others are more complex and controversial—manually cooling oceans so carbon dioxide-laden water sinks to the bottom more quickly; building space-based shields and mirrors to deflect solar heat from the planet; or injecting chemicals like hydrogen sulfide or sulfur dioxide into the upper atmosphere, creating an aerosol shield that reduces the amount of solar heat reaching the earth's surface.

But Carlson says geo-engineering comes with obvious international legal implications because no one country can implement its own geo-engineering plan without causing weather or climate changes in other countries. There's also the law of unintended consequences, because while many geo-engineering concepts have proved hopeful in the lab, nobody knows what will happen when actually put into

practice. For instance, Carlson says that while manually cooling the ocean may be seen as a generally good idea, what impact will that have on farmers in India whose crops depend on rain from heat-induced tropical monsoons?

To address these issues, Carlson urges the creation of an international governing body separate from any existing organization that approves or rejects geo-engineering plans, taking into consideration the best interests of people and countries around the world. He says any legal regimen involving geo-engineering activities should require they be publicly announced in the planning stage, and all countries are notified so they have a voice in deliberations.

As a model for his oversight body, Carlson suggests the International Monetary Fund (IMF). Like the IMF, his proposed organization would give all countries a place during discussions, but decisions would be made by a relatively small group of directors, each of which has a weighted vote that's based on their country's greenhouse gas production. That is, countries that produce more greenhouse gases will spend more money to combat global climate change, and so will have more votes.

Carlson's proposed body would oversee a compensation fund to help people and countries that are harmed by other country's approved geo-engineering activities, or by unseen effects of those activities.

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